# RUS-16K - FM HIGH POWER TRANSMITTERS

## SELF-SUFFICIENT
## SELF-COMBINABLE

RUS
Energy Saving Devotion

**An innovative transmitter that allows the connection of any number of parallel amplifier modules, without external combiners, delivering high efficiency, exceptional robustness, and uninterrupted operation.**

The equipment we present is undoubtedly state of the art: it is the most efficient FM transmitting system available. It incorporates self-combining modules for any power level from 6kW upward and, using 2kW cells, can be scaled to very high power levels capable of fully covering large urban centers.

The RUS system features a 48 VDC power input and an intelligent CPU that manages and balances alternative energy sources with the existing conventional power system. This architecture enables the connection of solar panels and wind generators installed directly on the transmission tower, resulting in unmatched energy savings.

SinteckNext
Developed and Manufactured by
Sinteck Next - Brazil 2025

drm FULLY Compatible
DRM & HD RADIO

# YOUR RADIO ON AIR - POWER IN YOUR HANDS!

## FIND OUT WHY THE BEST RADIO STATIONS IN OUR COUNTRY ARE USING RUS TRANSMITTERS

RUS is the most advanced equipment available today - and you can easily verify that.

You don't need to be an engineer, technician, or specialist to recognize it. By simply reviewing the transmitter's technical features, you will quickly realize that this is exactly what your radio station needs.

RUS is the only system that remains on air even during power outages. It features DC voltage inputs, allowing the customer to optionally install a battery deck that keeps the station broadcasting continuously, while also functioning as a built-in voltage stabilizer and UPS directly inside the transmitter.

RUS operates with three independent processing levels:

* A CPU in each Blade (we call BLADE the 2.2kW base amplifier module responsible for RF signal amplification);

* A centralized CPU-RUS control, supervision, and interaction unit, which monitors all installed Blades and manages preset switching and power reduction in response to any alert;

* A third external processing level, consisting of a virtual machine hosted on an Amazon server.

A dedicated unit called AC-RUS Module continuously monitors the entire electrical system and sends data to the processors, ensuring the integrity and reliability of the station on air even in the presence of improper voltage conditions.

The Blades act as the transmitter's engines, delivering real power to your station. They are interconnected without the need for outdated external combiners, using a self-coupled N+1 system that allows additional Blades to be added simply by replacing the rack transformer tube. This makes power expansion straightforward - just add more Blade units.

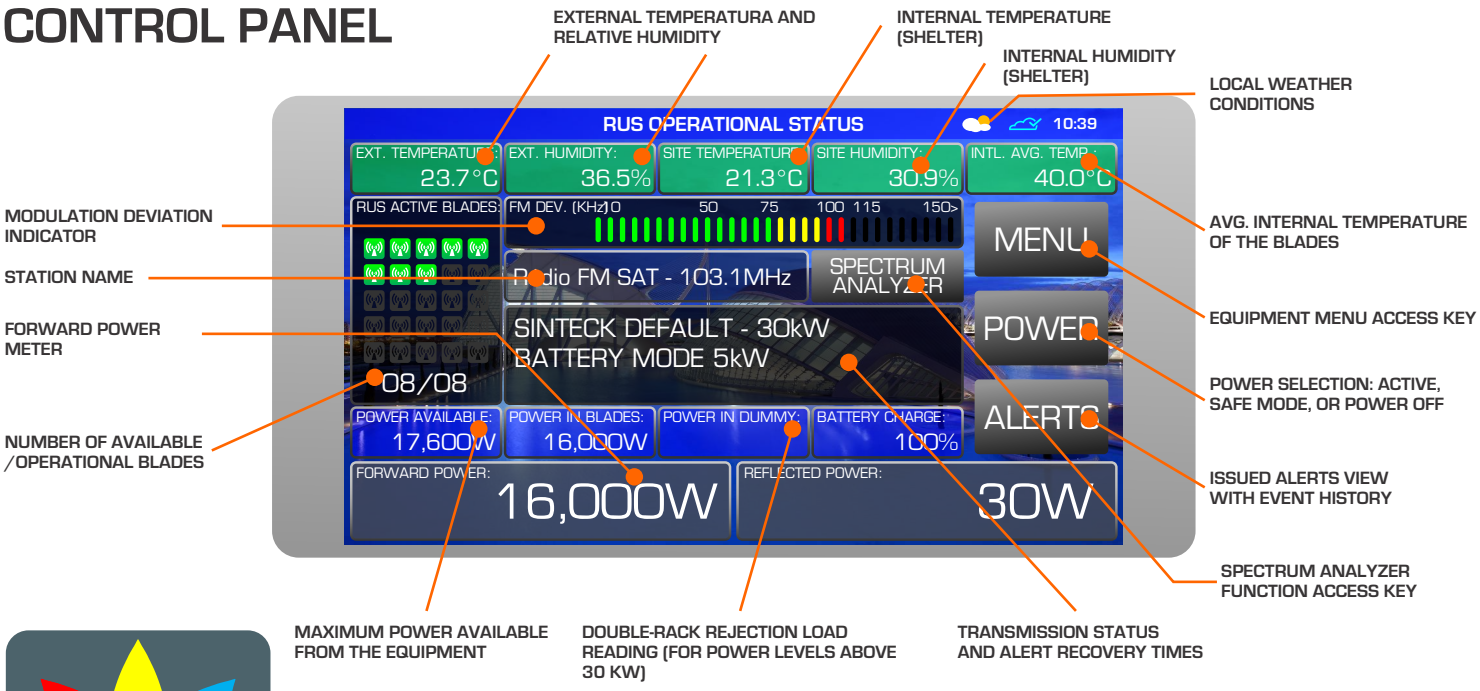
The system's robustness is directly related to the individual autonomy of each Blade. Even without connection to the CPU-RUS or internet access to the Virtual CPU, the modules remain coupled, active, and transmitting normally. This means the processing units do not need to be connected for the station to stay on air.

Each Blade consists of two 1.1kW amplifiers, delivering a total of 2.2kW of continuous output power, with adequate power reserve. The RF modules operate at approximately 85% efficiency and incorporate dual harmonic filters to ensure complete suppression of unwanted signals.

Beyond all this, one of RUS's greatest advantages is its external control capability: all parameters are literally in your hands, anywhere you have an internet connection. Its telemetry system is the most advanced among all domestic and imported transmitters.

And to put your competition even further behind, the RUS exciter is part of the XT line, delivering unmatched audio quality - ensuring your station achieves the best sound in your region.

## RUS CONTROL PANEL




RUS
Excelência em economia de energia

# CLEAR, ACCURATE, AND OBJECTIVE INFORMATION

Our engineering team has developed a product based on a fundamental principle: simplicity combined with technological sophistication. RUS provides the user with unmatched reliability, capable of remaining on air under any condition, even in the event of serious issues such as a complete power outage.

Its modular construction allows easy access to all equipment blocks, enabling any technician to perform preventive and corrective maintenance without taking the station off the air.

The system is built around an exciter with excellent audio quality and robustness - a 600W model from the XT line - capable of driving from 3 to 30 Blades, simply by adjusting the RF output level according to the final power of the RUS model. A system can start at 6kW and be expanded up to two combined 60kW racks using the same exciter. Power levels above 60kW can be achieved with no practical limits by doubling the number of racks and incorporating 3dB hybrid coupler.

The RUS rack features AC and DC power busbars, as well as a perfectly engineered grounding mesh. The same rack can be used for power levels ranging from 6kW (3 Blades) up to 30kW (15 Blades).The system is designed to meet any demand. Starting with three Blades, the customer can later add more units and increase power without replacing any equipment components, except for the final RF power combining transformer, which is individual, has a number of ports proportional to the number of Blades, and is tuned to a single frequency.

Each Blade delivers 2.2kW of output power and they are combined using a Gysel-type combiner system, where the rejection loads are integrated within each unit. This eliminates the need for external combiners, which are often inefficient and vulnerable. Each Blade performs self-combining, and at the final stage, the combining transformer raises the impedance to ensure proper matching between the transmitter and the antenna. The Blades are linear and broadband, capable of operating across the entire 88–108 MHz FM band. However, all other power-combining components are precisely tuned to the customer's operating frequency, resulting in higher EFFICIENCY.

The Blades feature 4-bit digital phase adjustment, with the CPU automatically determining the most efficient operating position.

The CPU-RUS module incorporates high-level processing that manages all values sent by the Blades through an internal rack data network. All devices are connected to a router, continuously exchanging information with the CPU.

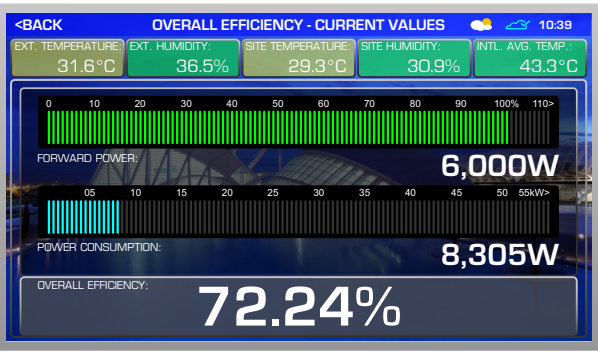
This CPU is responsible for displaying and processing all values provided by the Blades and the AC module. Once the system is initialized, the CPU controls the Blades so that each one delivers a predefined output power level. For example, in a 10kW system (RUS-10K), each Blade delivers 2kW. The CPU's primary role is to display the values transmitted by the Blades; it only sends commands when power needs to be increased or reduced. Otherwise, the Blades continue operating even if the CPU is disconnected.

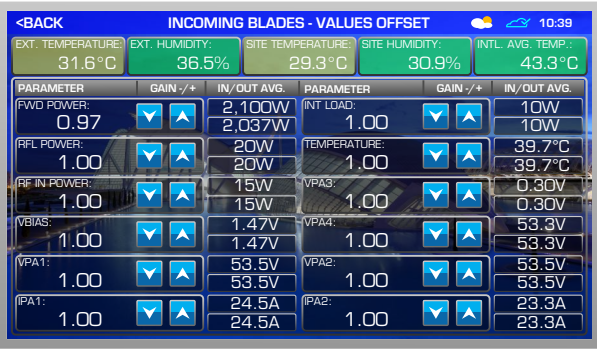
Finally, the system includes a device called the RUS AC Module, a high-precision voltage and current meter responsible for monitoring the voltage and current levels consumed by the equipment.

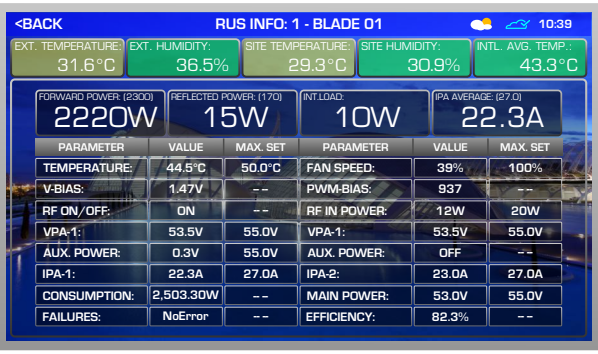
The RUS CPU is a complete on-board computer. Through it, all system parameters can be viewed: voltage, current, temperature, multiple power levels, and graphical data are displayed on a 7-inch color touchscreen monitor. There are more than 70 visualization and configuration screens. The menus are easy to navigate and organized into hierarchical levels, suitable both for highly technical users and for those who only wish to view the most basic operating values.

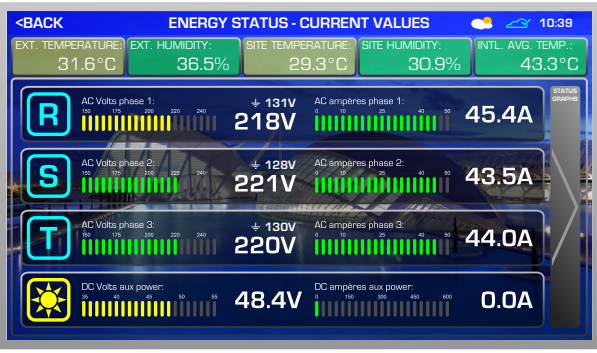
Basic configurations can be performed, such as output power presets based on scheduled times, programming of the Power Raise and Power Lower buttons, consumption and temperature monitoring, among others. More advanced configurations and internal adjustments are password-protected, restricted to users with full technical knowledge of the transmitter's operation.

Remote access completes the system's sophistication, providing exceptional convenience: from anywhere with an internet connection, the user can not only monitor but also configure any preset remotely.



# TECHNICAL FEATURES
# RUS-16K
# 16kW

| | |
|---|---|
| *Output Power:* | *18.000W ajustable from 180W* |
| *RF Output Impedance:* | *50 Ohms* |
| *RF Output Connector:* | *EIA 3-1/8" FLANGE* |
| *Frequency Range:* | *87,5 to 108,1MHz sinthesized (extended band 76,0 to 88,1MHz uppon request)* |
| *Frequency Steps:* | *10KHz* |
| *Settings Input:* | *7" color display with touchscreen capability, or telemetry/connectivity system* |
| *Frequency Stability:* | *1 ppm (High precision TCXO) max. frequency variation 100Hz* |
| *Modulation Type:* | *F3, FM direct modulation (VCO in final frequency) or DDS exciter according order* |
| *Harmonic Attenuation:* | *>80dBc* |
| *Residual AM Modulation (Asscr.):* | *Approximately 0,1% (65dB) to 100% modulation* |
| *Residual AM Modulation (Syncr.):* | *Approximately 0,05% (55dB) to 100% modulation* |
| *Intermodulation Distortion:* | *<0,05% @ 1kHz* |
| *Frequency Response:* | *20Hz to 100kHz* |
| *Signal/Noise FM Ratio:* | *>80dB* |

**POWER SUPPLY SECTION:**

| | |
|---|---|
| *AC Input:* | *220V or 380V threephase/monophase (Intl. selection) +/- 20%, 45 to 68Hz* |
| *DC input:* | *48V from external battery bank - built-in automatic recharging circuit* |
| *Surge Protection:* | *Banco de varistores, centelhadores a gás e transorbs e disjuntores de ação rápida* |
| *Overall Efficiency:* | *75% or better, in 220V AC, 85% or better in 48V DC* |
| *Global Eff. in Digital (FM+HD):* | *60% or better in 220V AC (HD -20dB)* |
| *DC Power Supplies:* | *9x Huawei SMPS model 4850G plus 3x Huawei 4875G auxiliar in AC Module Unit* |
| *Overall Cons. (Full Power):* | *24.000W* |

**MECHANICAL FEATURES:**

| | |
|---|---|
| *Weight:* | *270kgs* |
| *Dimensions:* | *41 Rack Units (2.10mts) x 560mm wide x 905mm depth* |
| *Operating Temperature:* | *-10 a +45°C to 100% Output power* |
| *Maximum Humidity:* | *95% for +45°C without condensation* |

**RF SECTION:**

| | |
|---|---|
| *RF Devices:* | *Blade: 2x LDMOS transistors AMPLEON ART1K6, total number of devices: 18* |
| *Cooling System:* | *Air-cooled, with forced ventilation that progressively increases according to intl. temp.* |

**CPU AND DISPLAY:**

| | |
|---|---|
| *CPU:* | *Intel Pentium Dual Core* |
| *Telemetry:* | *Incorporated, direct access via browser and Sinteck RUS APP, SNMP with MIB* |
| *Digital Audio Control:* | *Digital control of audio levels and presets, internal RDS generator* |
| *Digital Power Control:* | *Power Raise, Lower and Lock (and others presets set by the user)* |
| *Monitor:* | *TFT Color, size 7" 800 x 480 pixels with capacitive touch screen* |

**XLR INPUTS (ANALOG / DIGITAL):**

| | |
|---|---|
| *Connectors:* | *XLR Female* |
| *Digital Audio Input:* | *AES/EBU res. 24 bits, bitrate 32, 44.1, 48, 88.2, 96 and 192KHz automatic selection* |
| *Input Impedance:* | *600 Ohms balanced* |
| *Frequency Response:* | *± 0.1dB from 50Hz to 15kHz (THD+N < 0,1%)* |
| *Analog Input Level:* | *0dB to 75KHz carrier deviation* |
| *Pre-emphasis:* | *50uS or 75uS digital selection* |
| *Internal Audio Processor:* | *Single-band, response 20Hz to 20kHz, digitally enabled* |
| *Stereo Separation:* | *Better than 60dB @ 1kHz* |
| *USB Input (Front Panel):* | *MP3 player supporting mp3, mp2, mp1, asf, wma, m4a, 3gp, mp4 and wav* |

**MPX INPUT:**

| | |
|---|---|
| *Input Connection:* | *1 MPX Input (BNC connector), digital level adjust from +15/-10 dBm to 75KHz carrier dev.* |
| *Frequency Response:* | *± 0.05 dB from 20 Hz to 53 KHz and ± 0.2 dB from 53 KHz to 100 KHz, THD < 0,03%* |
| *Modulation Capability:* | *>250kHz* |

**SCA AND RDS INPUTS:**

| | |
|---|---|
| *Input Connection:* | *BNC connector, digital level adjust from +15/-10 dBm to 10kHz carrier deviation* |
| *Frequency Response:* | *± 0.2 dB from 53 KHz to 100 KHz* |

**RDS 19kHz TONE SYNC OUTPUT:**

| | |
|---|---|
| *Output Connection:* | *BNC connector, 1Vpp fixed level* |

**INTERNET CONNECTION:**

| | |
|---|---|
| *Connection:* | *RJ45, ethernet port* |

**10MHz SINCRONISM**

| | |
|---|---|
| *Connection:* | *BNC connector, automatic and manual operation selection* |

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